We claim,

1. A method for measuring potential tumorigenicity of mammalian cells comprising:

a) providing a tissue sample or sample of medium surrounding cells, and

b) detecting the presence of a fragment of α-dystroglycan in medium, said fragment having an Mr of 120-130kD, whereby the presence of the fragment indicates higher potential tumorigenicity.

2. The method of claim 1, wherein said detecting comprises:

a) adding to said sample a material selected from the group consisting of a monoclonal antibody to α-dystroglycan and laminin, and

b) measuring the size of the α-dystroglycan fragment detected.

3. The method of claim 1, wherein said cells are human mammary epithelial cells.

4. The method of claim 1, wherein said medium is blood serum.

5. A method for measuring potential tumorigenicity of cells, comprising:

a) providing a sample of said cells, and

b) detecting the presence of α-dystroglycan on the surface of the cells, whereby the absence of α-dystroglycan indicates a higher potential for tumorigenicity.

6. The method of claim 5, wherein said detecting comprises:

a) adding to said sample a monoclonal antibody to α-dystroglycan, and

b) measuring the amount of labeled α-dystroglycan detected.

7. The method of claim 5, wherein said cells are human mammary epithelial cells.

8. The method of claim 5, wherein said detecting comprises measurement of the amount of α-dystroglycan relative to the amount of β-dystroglycan, wherein a relative decrease of α-dystroglycan indicates α-dystroglycan shedding and higher potential tumorigenicity.

9. An assay for identifying inhibitors of a metaloproteinase which specifically cleaves α-dystroglycan from the cell surface, comprising:

a) providing multiple samples of a cell line,

b) suspending said samples in growth medium,

c) overlaying said samples with growth medium containing substances selected from the group consisting of metaloproteinase inhibitors, control substances, and suspect metaloproteinase inhibitors,

d) allowing growth medium overlaid cell lines to grow, and

e) identifying inhibitors of metaloproteinase activity by distinguishing between polarized and growth arrested cells (normal phenotype) and disorganized and invasive cells (tumorigenic phenotype).

10. The assay of Claim 9, wherein the cell lines are carcinoma cell lines.

11. The assay of Claim 9, where the metaloproteinase inhibitors were selected from the group consisting of GM6001 and TAPI.

12. The method of Claim 9, wherein the metaloproteinase inhibitors are used at concentrations between about 1 and 40 μM.

13. A method of suppressing the growth of mammalian tumor cells comprising the steps of:

a) providing a metalloprotease inhibitor capable of blocking cleaving of α-dystroglycan, and

b) administering a therapeutic concentration of said metalloprotease inhibitor to said tumor cells until growth of the cells is suppressed.

14. The method of claim 13, wherein the metalloprotease inhibitor is GM6001 or a pharmaceutically acceptable salt thereof.

15. The method of Claim 14, wherein the therapeutic concentration of GM6001 is at least 20 μM.

16. The method of Claim 14, wherein the therapeutic concentration of GM6001 is 40μM.

17. The method of Claim 13, wherein the metalloprotease inhibitor is selected from the ADAM's family of proteases or pharmaceutically acceptable salts thereof.

18. The method of Claim 13, wherein the metalloprotease inhibitor is TAPI.

19. The method of Claim 13, wherein the mammalian tumor cells are human T-4 tumor cells.

20. The method of Claim 13, wherein the mammalian tumor cells are human epithelial cells.

21. The method of Claim 13, wherein the tumor cells are human cells.

22. A method of assaying proteolysed α-dystroglycan fragments in blood serum comprising the steps of:

a) contacting a sample to be assayed with a labeled antibody specific for an α-dystroglycan fragment, and

b) assaying the amount of bound label.

23. The method of Claim 22, wherein the α-dystroglycan fragment is an approximately 120 kD fragment.

24. The method of Claim 22, wherein the α-dystroglycan fragment is an approximately 60 kD fragment.

25. A method of restoring normal dystroglycan function to a mammalian cell having an abnormal dystroglycan function which comprises contacting said cell with an adenovirus transfection agent containing a normal mammalian dystroglycan gene and a cationic agent which interacts with cell surfaces or nucleic acids so as to result in a cell with said normal functioning dystroglycan gene therein.

26 A assay for identifying metalloproteinase inhibitors of α-dystroglycan cleavage, comprising:

a) providing a quantity of a soluble form of an α-dystroglycan cleaving enzyme and a quantity of a soluble form of α-dystroglycan,

b) mixing said α-dystroglycan cleaving enzyme and the soluble form of α-dystroglycan,

c) adding to said mixture a substance selected form the group consisting of metalloproteinase inhibitors, control substances, and suspect metaloproteinase inhibitors, and

d) assessing for the presence of α-dystroglycan cleavage fragments to determine if cleavage has occurred.

27. The assay of Claim 26, wherein the enzyme is a soluble protein mixture extracted from whole cell fractionation.

28. The assay of Claim 26, wherein the soluble form of α-dystroglycan is a portion of the α-dystroglycan molecule, or a derivative thereof.